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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,250	09/28/2004	Shinji Shimosaki	12054-0029	1341

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EXAMINER	
PATEL, TAYAN B	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/509,250	SHIMOSAKI, SHINJI	
	Examiner	Art Unit	
	Tayan Patel, Esq.	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 November 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 7, 9-10, 13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Fray et al (WO 99/64638).

Regarding claims 1-2, Fray et al describes a method for purification wherein molten calcium chloride at 950 degrees C (melted alkali metal salt) was placed in a titanium crucible/vessel and brought in contact with titanium oxide (titanium alloy), to adsorb impurities of the metal salt. See page 9, lines 6-10. The prior art would inherently produce the purifying step because it performs the same method steps as recited in the claimed invention.

Regarding claim 3 and 10, Fray et describes titanium foil. See page 9, line 12.

Regarding claim 7, Fray et al describes a potential of 3V applied between the anode and the titanium crucible, thus, exhibiting electrolysis. See page 9, lines 6-10.

Regarding claim 9, Fray et al describes the same vessel is used for purification as for production of titanium material. See page 9, lines 6-10.

Regarding claim 13, Fray et al describes all of the claimed limitations of clam 2 above, further describing the production of titanium. See page 9, lines 12-15.

Regarding claim 15, Fray et al describes titanium (TiO2) added to the bath for the purification step. See page 9, lines 6-10.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 4-6, 12 & 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fray et al (WO 99/64638) as applied to claim 1 and further in view of Fray et al (WO 2003/048399 - US 2006/0086621 will be used as the English equivalent).

Regarding claim 4-5, Fray et al ('638) describes an electrolysis method of a fused salt (See abstract) wherein CaCl2 is the molten salt (See page 9, lines 6-10), but does not expressly describe the addition of calcium to the purified molten product.

Fray et al ('221) describes an electrochemical method of a fused salt (See abstract) wherein calcium, 8, is added to the bath of CaCl2 melt in order to improve the

amount of oxygen that can be removed from titanium (See figure 2; See also figure 5, para 0064-0069).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the calcium of Fray et al ('221) in the method of Fray et al ('638) in order to improve the amount of oxygen that can be removed from titanium.

Regarding claim 6, Fray et al ('638) describes the same vessel is used for purification as for production of titanium material. See page 9, lines 6-10.

Regarding claim 12, modified Fray et al ('638) describes all of the claimed limitations as discussed with respect to claim 5 above, wherein Fray et al ('638) describes the same vessel is used for purification as for production of titanium material. See page 9, lines 6-10.

Regarding claim 16, Fray et al ('638) describes titanium (TiO2) added to the bath for the purification step. See page 9, lines 6-10.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fray et al (WO 99/64638) as applied to claim 2 and further in view of Fray et al (WO 2003/048399 - US 2006/0086621 will be used as the English equivalent).

Regarding claim 11, Fray et al ('638) describes an electrolysis method of a fused salt (See abstract) wherein CaCl2 is the molten salt (See page 9, lines 6-10), but does not expressly describe the addition of calcium to the purified molten product.

Fray et al ('221) describes an electrochemical method of a fused salt (See abstract) wherein calcium, 8, is added to the bath of CaCl2 melt in order to improve the

amount of oxygen that could be removed from the titanium (See figure 2; See also figure 5, para 0064-0069).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the calcium of Fray et al ('221) in the method of Fray et al ('638) in order to improve the amount of oxygen that could be removed from the titanium.

7. Claims 8 & 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fray et al (WO 99/64638) as applied to claim 1 and further in view of Shindo et al (Japanese Patent # 03291391).

Regarding claim 8, Fray et al ('638) describes all of the claimed limitations of claim 1 above, further disclosing the production of pure titanium (See page 9, lines 12-15), but does not describe LiCl-KCl system mixed salt used for electrolysis of the molten salt.

Shindo et al discloses a method for producing high purity titanium wherein foil like titanium is immerse into an electrolyte bath of LiCl-KCl used as molten salt for electrolysis in order to produce extremely high purity titanium in superior yield. See abstract.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the LiCl-KCl mixed salt in Shindo et al in the method of Fray et al ('638) in order to produce extremely high purity titanium in superior yield.

Regarding claim 14, Fray et al ('638) describes the same vessel used for purification as for production of titanium material and bringing into contact (all are brought into contact within the crucible containing electrolyte). See page 9, lines 6-10.

Response to Arguments

Applicant's arguments, see Remarks, filed 09 November 2007, with respect to the rejection(s) of claim(s) 1-14 under 35 U.S.C. 102/103 have been fully considered and are persuasive because Shimokazi fails to describe impurities in the titanium adsorbed into the salt as recited in claim 1. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Fray et al (WO 99/64638) and Fray et al (WO 2003/048399 - US 2006/0086621 is the English language equivalent). Fray et al ('638) anticipates claim 1, particularly because an alkali metal salt is melted in a crucible and brought in contact with titanium. Because the steps anticipate the claimed invention, the method of purification inherently occurs.

35 USC 112

Examiner withdraws the rejection as to claim 14 in response to Applicant's revision.

35 USC 102/103

The arguments presented by Applicant regarding claims 1 and 4 have been rejected in view of new prior art, *supra*.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tayan Patel, Esq. whose telephone number is (571) 272-9806. The examiner can normally be reached on Monday-Thursday, 8 AM-6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TBP

ALEXA D. NECKEL
SUPERVISORY PATENT EXAMINER